

REMARKS

Re-consideration and allowance of the claims are respectfully requested in view of the following remarks. The Examiner's attention is directed to the telephone interview conducted January 13, 2003, during which discuss

In reference to Detailed Action Item 1:

The specification has been amended to address the Examiner's concerns. No new matter is added.

Claims 1 - 27 are pending in the present application.

In reference to Detailed Action Item 2:

Claims 1 - 14, 21, 23 - 25, and 27 stand rejected under 35 U.S.C. §112 second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention. As to Claims 1 and 6, the element 'low-pass portion of the error signal would be understood and appreciated by one skilled in the art to be the resultant of an input signal following application to a low pass filter. This language is not indefinite. Applicants are unsure as to why the Examiner finds the language as claimed objectionable. However, should the Examiner still find the language unacceptable, Applicant requests a telephone conference to discuss the language of the claim. With regard to the language of Claim 6 and 27, Applicants have amended Claims 6 and 27 to address the Examiner's concerns on structure. Applicant notes however, that the terminology "a high-pass gain," "a low-pass gain," and "an error signal" is not indefinite; each of these terms is introduced and identified in the detailed description. For example at page 4 in paragraphs 21-23. Moreover, the elements are clearly depicted on Fig. 4. Regarding Claims 14 and 25, Applicants have amended Claim 14 and 26 to correct the antecedent basis. With regard to Claim 23, following the abovementioned telephone interview, Applicants believe the claim language is no longer objectionable to the Examiner. Finally, The specification has been amended to address the Examiner's concerns about claims 24 and 25.

In reference to Detailed Action Item 3:

Claims 1, 4 - 13, 24, and 25 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Kuzuya et al. (U.S. Patent No. 5,859,774) in view of Shimizu et al. (U.S. Patent No. 6,148,948).

With regard to Claims 1, 4 - 13, 24, and 25

With regard to Claim 1 the Examiner suggests that:

"...Kuzuya discloses a method of controlling a feel-back torque of a motor, the steps comprising receiving a signal indicative of a difference between a desired motor position, and an actual motor position (col 7, lines 10-12), and, applying a gain (col 7, lines 18-19)

The patent (Kuzuya?) does not disclose filtering the signal, while Shimizu shows bandpass filter 22.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a bandpass filter, as shown in Shimizu, for further processing with the resultant high and low frequencies of the particular signal. It is well known in the art to apply a filter to the raw signal to eliminate undesired components."

Applicants respectfully contend that the explanation provided in the office action mischaracterizes the disclosure of Kuzuya and Shimizu et al., and further contends that it would not have been obvious to one skilled in the art at the time the invention was made or used to modify the teachings of Kuzuya with the teachings of Shimizu et al. Moreover, one skilled in the art would not be motivated to formulate the combination suggested in the office action because neither Kuzuya and Shimizu et al. include the requisite motivation for such a combination, and even if such a combination were made, it would not provide a reasonable expectation of success for arriving at Applicant's invention.

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing that all elements of the invention are disclosed in the prior art; that the prior art relied upon, coupled with knowledge generally available in the art at the time of the invention, must contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references; and that the proposed modification of the prior art must have had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); *In Re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970); *Amgen v. Chugai Pharmaceuticals Co.*, 927 U.S.P.Q.2d, 1016, 1023 (Fed. Cir. 1996). See MPEP 2143

Establishing a prima facie case of obviousness requires that all elements of the invention be disclosed in the prior art. *In Re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970).

Further, even assuming that all elements of an invention are disclosed in the prior art, an Examiner cannot establish obviousness by locating references that describe various aspects of a patent applicant's invention without also providing evidence of the motivating force which would have impelled one skilled in the art to do what the patent applicant has done. *Ex parte Levensgood*, 28 U.S.P.Q. 1300 (Bd. Pat. App. Int. 1993). The references, when viewed by themselves and not in retrospect, must suggest the invention. *In Re Skoll*, 187 U.S.P.Q. 481 (C.C.P.A. 1975).

Considering Claim 1, 13, Applicants respectfully contend that the explanation provided in the office action mischaracterizes the disclosure of Kuzuya and Shimizu et al., and further contends that it would not have been obvious to one skilled in the art at the time the invention was made or used to modify the teachings of Kuzuya with the teachings of Shimizu et al. More specifically, neither Kuzuya nor Shimizu et al. alone or in combination, disclose or teach each of the elements in the claimed invention. Kuzuya does not teach or disclose a method controlling feed back torque in a motor as suggested in the office action. Additionally, Kuzuya does not disclose or teach "filtering the received signal into a plurality of frequency bands. While, Kuzuya does disclose, "applying a gain" as suggested in the office action, this element is not the same as claimed by the Applicants. The claimed invention includes "applying a gain to at least one of the filtered frequency bands..." Kuzuya, applies the error signal directly to a proportional gain of a PID controller. Applicants invention applies a filter and then a gain to the filtered signal. While similar, Kuzuya actually teaches away from the claimed invention by applying the gain to the entire spectral content of the error signal disclosed therein, whereas the claimed invention applies the gain to "filtered frequency bands..." Shimizu et al. merely discloses a band pass filter and the office action explanation includes no further explanation as to why Shimizu et al. is relied upon. Therefore, because neither Kuzuya nor Shimizu et al., disclose or teach any of the abovementioned claimed elements, the Examiner has not made a prima facie case for obviousness as to Claims 1 and 13, and the rejections should be withdrawn. Thus, Claims 1 and 13 should now be in a condition for allowance and the rejections withdrawn.

Second, assuming *arguendo* that Kuzuya and Shimizu et al., disclose the same elements as claimed by the Applicants, the Examiner has not shown what motivation is disclosed or taught in either Kuzuya or Shimizu et al., that would to impel one skilled in the

art to make the combination. Kuzuya is related to and discloses aspects of rear wheel steering, while Shimizu et al. is related to an electric power steering system. Nothing in Kuzuya, nor Shimizu et al. provides the motivation to make the combination as suggested in the office action. In fact, both Kuzuya and Shimizu teach away from the suggested combination. Kuzuya teaches away from the combination in that it relates to real wheel steering not providing a feel back torque as claimed by the Applicants. Kuzuya also teaches away from the combination because it teaches application of a PID controller, so its intent was to formulate control based on the steering angle difference disclosed therein as well as its derivative and its integral. There is nothing to suggest that the use of filtering would be appropriate.

Similarly, Shimizu includes nothing that would motivate the combination of the two references. The filtering cited by the office action explanation is applied to a torque signal in that invention. There is nothing in Shimizu that would teach applying the filter to a position error signal and thereby dividing the received signal into a plurality of frequency bands as claimed. Therefore, because neither Kuzuya nor Shimizu et al., include any teaching which would motivate the suggested combination, the Examiner has not made a prima facie case for obviousness as to Claims 1 and 13, and the rejections should be withdrawn. Thus, Claims 1 and 13 should now be in a condition for allowance and the rejections withdrawn.

Moreover, even if such a combination were made, the combination would not provide a reasonable expectation of success for arriving at Applicant's invention. For an obviousness rejection to be proper, the Examiner must meet the burden of establishing that the proposed modification of the prior art must have had a reasonable expectation of success. MPEP 2143.02. The combination suggested would integrate a band pass filter of Shimizu et al. with the control section of Kuzuya. As stated earlier, this combination would not work because it would combine filtering with the PID controller in Kuzuya and thereby not result in the invention as claimed.

Equally important, the suggested modification cannot change the principle of operation of a reference. MPEP 2143.01. The suggested combination would completely change the principles of operation disclosed Kuzuya as that invention specifically teaches the utilization of a PID controller on the steering angle difference. To make the combination suggested would imply modification of the spectral content of the steering angle difference as applied to the PID controller. By doing so, the PID controller invoked in Kuzuya would be rendered to perform a different operation as the frequency based integral and derivative

portions would no longer operate as disclosed in that invention. Therefore, because the combination suggested by the office action would change the principle of operation of Kuzuya and Shimizu et al. the Examiner has not made a prima facie case for obviousness as to Claims 1 and 13, and the rejections should be withdrawn. Thus, Claims 1 and 13 should now be in a condition for allowance and the rejections withdrawn.

With regard to Claims 2 – 5 these claims include the abovementioned limitations and based on the arguments above are therefore now allowable. Additionally, Claims 2 – 5 depend from Claim 1, which is now allowable based upon the abovementioned reasoning, and therefore because these claims depend from a claim that is allowable, they too are allowable and the rejections should be withdrawn. MPEP 2143.03.

With regard to Claims 6 – 12 and 27:

The office action explanation suggests: "The patents disclose the recited elements."

The office action explanation provides no support for this statement or the rejection. However, the office action does not disclose the recited elements. Kuzuya does not disclose or teach "a feel control algorithm", nor "at least one of a high-pass gain and a low-pass gain." As stated above, Kuzuya relates to a rear wheel steering algorithm and does not disclose or teach an active steering system as claimed. Therefore, because neither Kuzuya nor Shimizu et al., disclose or teach any of the abovementioned claimed elements, the Examiner has not made a prima facie case for obviousness as to Claims 6 - 12 and 27, and the rejections should be withdrawn. Thus, Claims 6 - 12 and 27 should now be in a condition for allowance and the rejections withdrawn.

With regard to Claims 7 – 12 these claims include the abovementioned limitations and, based on the arguments above are therefore now allowable. Additionally, Claims 7 – 12 depend from Claim 6, which is now allowable based upon the abovementioned reasoning, and therefore because these claims depend from a claim that is allowable, they too are allowable and the rejections should be withdrawn. MPEP 2143.03.

Claims 2, 3, 14 – 18, 21 – 23, 25, and 27 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Kuzuya et al. (U.S. Patent No. 5,859,774) in view of Shimizu et al. (U.S. Patent No. 6,148,948) in further view of Phillips (U.S. Patent No. 6,370,459).

With regard to Claims 2 and 3, Applicants respectfully contend that the explanation provided in the office action mischaracterizes the disclosure of Kuzuya, Shimizu et al., and Phillips, and further, contends that it would not have been obvious to one with ordinary skill

in the art at the time the invention was made to include this element (a differential), as shown in Phillips, "to further increase the sensitivity of the steering system with respect to the desired steering angle, thus enhance its performance.

Applicants respectfully contend that Phillips does not disclose a differential as cited in the office action. The cited element 712/722 is described as a speed reduction means (712) and gear reduction means (722). This is not the same as the differential as claimed. Therefore, because neither Kuzuya, Shimizu et al., nor Phillips disclose the elements of the claimed invention, the Examiner has not made a prima facie case for obviousness as to Claims 2 and 3, and the rejections should be withdrawn. Thus, Claims 2 and 3 should now be in a condition for allowance and the rejections withdrawn.

With regard to Claims 14 and 26, once again as outlined above, neither Kuzuya, Shimizu et al., nor Phillips alone, or in combination, disclose or teach each of the elements in the claimed invention. Kuzuya does not disclose or teach "calculating a correction signal..." Similarly, Kuzuya does not disclose or teach "filtering the correction signal into a plurality of frequency bands." While, Kuzuya does disclose, "applying a gain" as suggested in the office action, this element is not the same as claimed by the Applicants. The claimed invention includes "applying a gain to at least one of the filtered bands..." As stated earlier, Kuzuya, applies the error signal directly to a proportional gain of a PID controller. Applicants invention applies a filter and then a gain to the filtered signal. While similar, Kuzuya actually teaches away from the claimed invention by applying the gain to the entire spectral content of the error signal disclosed therein, whereas the claimed invention applies the gain to "...filtered frequency bands..." Shimizu et al. merely discloses a band pass filter and the office action explanation includes no further explanation as to why Shimizu et al. is relied upon. Finally, Applicants respectfully contend that Phillips does not disclose a differential as cited in the office action. The cited element 712/722 is described as a speed reduction means (712) and gear reduction means (722). This is not the same as the differential as claimed. Therefore, because neither Kuzuya, Shimizu et al., nor Phillips, disclose or teach any of the abovementioned claimed elements, the Examiner has not made a prima facie case for obviousness as to Claims 14 and 26, and the rejections should be withdrawn. Thus, Claims 14 and 26 should now be in a condition for allowance and the rejections withdrawn.

Second, assuming arguendo, that Kuzuya, Shimizu et al. and Phillips in combination, disclose the same elements as claimed by the Applicants, the Examiner has not shown what motivation is disclosed or taught in Kuzuya, Shimizu et al., or Phillips, that would to impel

one skilled in the art to make the combination. Nothing in Kuzuya, Shimizu et al., nor Phillips provides the motivation to make the combination as suggested in the office action. In fact, Kuzuya and Shimizu specifically teach away from the suggested combination. Kuzuya teaches away from the combination in that it relates to real wheel steering not providing a feel back torque as claimed by the Applicants. Kuzuya also teaches away from the combination because it teaches application of a PID controller, so its intent was to formulate control based on the steering angle difference disclosed therein as well as its derivative and its integral. There is nothing to suggest that the use of filtering would be appropriate.

Similarly, as argued above, Shimizu includes nothing that would motivate the combination of the two references. The filtering cited by the office action explanation is applied to a torque signal in that invention. There is nothing that would teach applying the filter to a correction signal and thereby dividing the signal into a plurality of frequency bands as claimed. Therefore, because neither Kuzuya, Shimizu et al., nor Phillips include any teaching which would motivate the suggested combination, the Examiner has not made a prima facie case for obviousness as to Claims 14 and 26, and the rejections should be withdrawn. Thus, Claims 14 and 26 should now be in a condition for allowance and the rejections withdrawn.

Moreover, even if such a combination were made, the combination would not provide a reasonable expectation of success for arriving at Applicant's invention. For an obviousness rejection to be proper, the Examiner must meet the burden of establishing ... that the proposed modification of the prior art must have had a reasonable expectation of success. MPEP 2143.02. The combination suggested would integrate a band pass filter of Shimizu et al. with the control section of Kuzuya. As stated earlier, this combination would not work because it would combine filtering with the PID controller in Kuzuya and thereby not result in the invention as claimed.

Equally important, the suggested modification cannot change the principle of operation of a reference. MPEP 2143.01. The suggested combination would completely change the principles of operation disclosed Kuzuya as that invention specifically teaches the utilization of a PID controller on the steering angle difference. To make the combination suggested would imply modification of the spectral content of the steering angle difference as applied to the PID controller. By doing so, the PID controller invoked in Kuzuya would be rendered to perform a different operation as the frequency based integral and derivative portions would no longer operate as disclosed in that invention. Therefore, because the

combination suggested by the office action would change the principle of operation of Kuzuya and Shimizu et al. the Examiner has not made a prima facie case for obviousness as to Claims 14 and 26, and the rejections should be withdrawn. Thus, Claims 14 and 26 should now be in a condition for allowance and the rejections withdrawn.

With regard to Claims 15 this claims include the abovementioned limitations and based on the arguments above are therefore now allowable. Additionally, Claim 15 depends from Claim 14, which is now allowable based upon the abovementioned reasoning, and therefore because these claims depend from a claim that is allowable, they too are allowable and the rejections should be withdrawn. MPEP 2143.03.

With regard to Claim 16 the explanation in the office action states:

"Kuzuya discloses
Feel controller, comprising element CS
vehicle stability input means 21, and
steering actuator 10, but does not disclose a differential actuator.

Phillips shows:

A signal output to motor 26 (col. 24, lines 40 – 41), from which a signal is input to differential 712/722 connected to steering actuator 16. It would have been obvious to one with ordinary skill in the art at the time the invention was made to include a differential, as shown in Phillips, to increase the range of steering torque, thus increase the efficiency of the system to effect the desired steering angle."

Applicants respectfully contend, once again as outlined above, neither Kuzuya, Shimizu et al., nor Phillips alone or in combination, disclose or teach each of the elements in the claimed invention. Kuzuya does not disclose or teach "a feel controller in signal communication with said input device, said steering actuator and said differential actuator for controlling a feel back torque." Similarly, Phillips does not disclose a differential as cited in the office action. The cited element 712/722 is described as a speed reduction means (712) and gear reduction means (722). This is not the same as the differential as claimed." Moreover, the explanation provided in the office action refers to a "feel controller CS, the element identified as CS in Kuzuya is the controlled system, not a controller. Moreover, the explanation in the office action states: "It would have been obvious ...to include a differential...to increase the range of steering torque, thus increase the efficiency of the system to effect the desired steering angle." Applicant does not understand this explanation. Nothing in the Applicant's invention is drawn to "increas(ing) the range of steering torque thus increase the efficiency of the system" as suggested in the office action. Therefore,

because neither Kuzuya, Shimizu et al., nor Phillips, disclose or teach any of the abovementioned claimed elements, the Examiner has not made a prima facie case for obviousness as to Claim 16 and the rejections should be withdrawn. Thus, Claims 16 should now be in a condition for allowance and the rejections withdrawn.

Second, assuming *arguendo*, that Kuzuya, Shimizu et al. and Phillips in combination, disclose the same elements as claimed by the Applicants, the Examiner has not shown what motivation is disclosed or taught in Kuzuya, Shimizu et al., or Phillips, that would to impel one skilled in the art to make the combination. Nothing in Kuzuya, Shimizu et al., nor Phillips provides the motivation to make the combination as suggested in the office action. In fact, Kuzuya and Shimizu specifically teach away from the suggested combination. Kuzuya teaches away from the combination in that it relates to real wheel steering not providing a feel back torque as claimed by the Applicants. Kuzuya also teaches away from the combination because it teaches application of a PID controller, so its intent was to formulate control based on the steering angle difference disclosed therein as well as its derivative and its integral. There is nothing to suggest that the use of filtering would be appropriate. Therefore, because neither Kuzuya, Shimizu et al., nor Phillips include any teaching, which would motivate the suggested combination, the Examiner has not made a prima facie case for obviousness as to Claim 16 and the rejections should be withdrawn. Thus, Claim 16 should now be in a condition for allowance and the rejections withdrawn.

With regard to Claims 17 - 25, these claims include the abovementioned limitations and based on the arguments above are therefore now allowable. Additionally, Claim 17 - 25 depend from Claim 16, which is now allowable based upon the abovementioned reasoning, and therefore because these claims depend from a claim that is allowable, they too are allowable and the rejections should be withdrawn. MPEP 2143.03.

The amendments and arguments here presented are made for the purposes of better defining the invention, rather than to overcome the rejections for patentability. The claims were not amended to overcome the prior art and therefore, no presumption should attach that either the claims have been narrowed over those earlier presented, or that subject matter or equivalents thereof to which the Applicants are entitled has been surrendered. Support for these amendments can be found in the specification and claims as originally filed. No new matter has been introduced by these amendments. Consideration and allowance of the claims is respectfully requested in view of the amendments and following remarks. Moreover, the

amendments as presented do not alter the scope of the claimed invention and therefore cannot necessitate a new grounds rejection.


It is believed that the foregoing remarks are fully responsive to the Office Action and restriction and that the claims herein should be allowable to the Applicants. Accordingly, reconsideration and withdrawal of the rejections are requested.

In the event the Examiner has any queries regarding the instantly submitted response, the undersigned respectfully requests the courtesy of a telephone conference to discuss any matters in need of attention.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130.

Respectfully submitted,

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MARKED UP VERSION OF CHANGES MADE

In the Detailed Description:

Please amend paragraph 14 as follows in "marked up" format with changes identified:

The differential actuator 22 includes an actuator housing 24, which receives the steering input shaft 18 as its first input, and provides a steering output shaft 26. A motor 30 is connected to a motor shaft 32, which is received by the actuator housing 24 as its second input. A steering rack 34 is connected to the steering output shaft 26. A road-wheel position sensor 28 is disposed at the steering output shaft 26 for sensing the position of the road-wheels 14. A controller 35 is in signal communication between the hand-wheel position sensor 20, the road-wheel position sensor 28, and the motor 30. The active steering system 10 may further comprise an assist controller 36 in signal communication with the differential actuator 22. The controller 35 is also in signal communication with the assist controller 36 for adjusting a variable assist.

In the Claims:

Please amend Claim 6 as follows in "marked up" format with changes identified:

6. A controller for an active steering system, the controller comprising:
a feel control algorithm for controlling a feel back torque to a driver, said feel control algorithm comprising a filter, and at least one of a high-pass gain and a low-pass gain;
wherein at least one of said high-pass gain and said low-pass gain correspond to at least one of an error signal and the low-pass portion of the error signal.

Please amend Claim 12 as follows in "marked up" format with changes identified:

12. A controller as defined in Claim 6 wherein the low-pass said filter is a first-order filter.

Please amend Claim 14 as follows in "marked up" format with changes identified:

14. A method for actively controlling the steering of a motor vehicle, the method comprising:

- receiving an operator input from an operator of the motor vehicle;
- receiving a stability input indicative of ~~the~~a dynamic stability of the motor vehicle;
- calculating a correction signal in accordance with the operator input and the stability input;
- filtering the correction signal into a plurality of frequency bands;
- applying a gain to at least one of the filtered bands to produce an output signal corresponding to a desired feel back torque; and
- adjusting an input to a differential actuator in accordance with the output signal.

Please amend Claim 23 as follows in "marked up" format with changes identified:

23. An active steering system as defined in Claim 22 wherein said feel controller further comprises a summing function for receiving ~~the~~an input of the low-pass filter and ~~the~~an output of the low-pass filter, and for providing an input to a high-pass gain function. Please amend Claim 26 as follows in "marked up" format with changes identified:

Please amend Claim 26 as follows in "marked up" format with changes identified:

26. An active steering system comprising:

- means for receiving a steering input from an operator of the motor vehicle;
- means for receiving a stability input indicative of ~~the~~a dynamic stability of the motor vehicle;
- means for calculating a correction signal in accordance with the steering input and the stability input;
- means for filtering the correction signal into a plurality of frequency bands;
- means for applying a gain to at least one of the filtered bands to produce an output signal corresponding to a desired feel back torque; and
- means for adjusting an input to a differential actuator in accordance with the output signal.

Please amend Claim 27 as follows in "marked up" format with changes identified:

27. A motor controller, comprising:

a feel control algorithm for controlling a feel back torque to an operator, said
feel control algorithm comprising a filter, and at least one of a high-pass gain and a low-pass
gain;

wherein at least one of a said high-pass gain and said low-pass gain
correspond to at least one of an error signal and a low-pass portion of the error signal.